CURRENT LITERATURE.

The Rusts and Smuts.

The rusts (Uredineæ) and smuts (Ustilagineæ) have for a long time been favorite objects for collection and study by botanists. The former, especially, have attracted much attention both on account of their neat and varied spore forms and the readiness with which in general they may be distinguished by the hosts on which they grow. It is significant also that we owe one of the most interesting chapters in the study of the life history of fungi to the economic relation of rusts to agriculture. It is fitting that such well marked and interesting groups should receive independent treatment, and the assertion is abundantly substantiated by a recent work which lies before us. This is Mr. Charles B. Plowright's[1] account of the British species of these two groups, prefaced by a statement of the general conditions of their development and of their experimental cultivation.

There has always been a curious association of the rusts and smuts in the minds both of the pub'ic and of the scientist, although it has not yet been shown that they have any actual relationship that might justify it. Mr. Plowright's book would doubtless have been just as acceptable with the smuts omitted, although cutting out nearly one-fourth the pages and one-half the illustrations, for he has added little to what was already well known about them.

The chief interest of the volume lies in the part on the rusts, and the treatment is so satisfactory as to amply justify the publication in book form. The publisher's part has been well done, if one is inclined to accept the liberal use of heavy paper, wherein we detect a willingness to expand two dollars' worth of matter into a four dollar volume, as is the custom with certain American firms.

Every one of the seventy pages on the biology and experimental treatment of the rusts shows the author's intimate knowledge of his subject gathered from extensive independent research. He tells us of the mycelium, of the several spore forms and their significance, of the remarkable history of heterœcism, and of his own excellent methods of spore culture. This he does concisely and by the use of admirable dic, tion. Any one who is studying, or thinks of studying, these fungi wil find this part of the work of unusual interest and importance.

After the biological part, occupying about one-third the book, comes the systematic treatment of the British species. The arrangement of the rusts is essentially that proposed by Schröter, but the position of many

[1] PLOWRIGHT, CHARLES B.—A monograph of the British Uredineæ and Ustilagineæ, with an account of their biology, including the methods of observing the germination of their spores and of their experimental culture. pp. 347, 13 wood cuts and 8 plates. 8vo. London: Kegan Paul, Trench & Co., 1889. 10s. 6d.

of the species has been determined by Mr. Plowright's cultures. The biological notes appended to the description of many of the species are particularly important, and give evidence of the author's careful and extensive research.

No more need be said for the illustrations than that they are well executed.

Those familiar with the subject need not be told that this work, owing to the large number of species common to the United States and Great Britain, is almost as serviceable to American botanists as to the English.

A New Text-book of Botany.[2]

This is the day of text-books, and an active botanist seems hardly to have done his duty until he has prepared a text-book, a laboratory guide, or at least a scheme for plant analysis. The book before us is a revised and enlarged edition of the "Elements of Botany," recently published by the same author, and contains "organography, vegetable histology, vegetable physiology and vegetable taxonomy, with a brief account of the succession of plants in geologic time, and a glossary of botanical terms." Attempting, as it does, to cover nearly the whole field of botany, there can be no elaborate discussion. The author has prepared his text with great care, and has brought together in compact shape much that is best in modern botany. If we were inclined to point out defects in this really painstaking book, we would say that the illustrations are not all they might be. Many of them are copies from standard figures, and would have looked better if they had been reproduced by some photographic process rather than redrawn. But this is a minor matter, when the figures are accurate. In the illustration on page 197, however, we have a transverse section of a leaf in which the stomata are shown in surface view, a thing that is apt to be misleading. The book is a useful one and will serve its purpose well.

Minor Notices.

PROF. C. S. SARGENT has done good service to botanists by editing portions of the journal of André Michaux. It is published by the Amer. Philosophical Society in a pamphlet of 145 pages. The editor acknowledges the great assistance rendered by Mr. John H. Redfield, for without it "the publication would never have been begun, and could not have been finished." The journal is more than a diary of travel, for it contains much valuable information concerning the plants discovered, and the condition of remote settlements as an intelligent traveler saw them in the last century.

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[2] BASTIN, EDSON S.—College Botany. 8vo., pp. xv, 451, with nearly 600 illustrations Chicago: G. P. Engelhard & Co., 1889. $3.00.

DR. WM. TRELEASE has published the results of his study of Ilicineæ and Celastraceæ.[3] The paper is intended more as a call for additional information than as a completed synopsis. In Ilex no change of nomenclature is proposed except the reduction of I. myrtifolia to a variety of I. Dahoon. A new species of Euonymus from S. California is described. A notable feature of the paper is that it includes notes on the biology and paleobotany of the groups considered.

ILLUSTRATIONS of West American Oaks, from drawings by the late Dr. A. Kellogg, has just been published in San Francisco. Prof. E. L. Greene has prepared the text, while the funds for this elaborate quarto pamphlet of over 50 pages and 24 plates have been provided by James M. McDonald, Esq. A sketch of the life and work of Dr. Kellogg is given by Mr. George Davidson, while an introductory account of oaks in general is from the pen of Prof. Greene. The work is a most commendable one, and the careful sketches of this difficult group made by an acute observer are better than any amount of verbal description. Professor Greene has also done his work well, and given us a careful account of the bibliography and range of the species. The new species proposed are Q. MacDonaldi, Q. Engelmanni (*Q oblongifolia* Engelm. in part), and Q. turbinella.

WHAT SHALL constitute a species, is even a more puzzling question among bacteriologists than it is to the phænogamist. Dr. Trelease stated his views on this question recently to the Alumni Association of the St. Louis Medical College, and his address is printed in the *Weekly Medical Review*, xix. 309. Morphological characters, with proper allowances, including the mode of growth in solid cultures and the behavior of the cells towards staining fluids are of prime importance. Physiological characters (such as pigment production, specific fermentation and liquefaction of gelatine) are apparently reliable. Pathogenic characters are too unreliable to render species which depend on them above suspicion.

A VERY interesting address is that from the same gentleman on Myrmecophilism, delivered as retiring president of the Cambridge Entomological Club.[4] The author considers the functions of extra-nuptial nectar-glands, the occasional ant-domiciles on plants, and myrmecophilous plants proper. The paper deals so much with details that it is impossible to summarize it. It is accompanied by a bibliography of the important papers on this subject.

PROFESSOR PENHALLOW has endeavored to bring together in a connected form the more important facts relating to the development of botanical science in Canada.[5] The first 266 years, *i. e.*, from the first

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[3] Trans. St. Louis Acad. Science, v, 343–357.

[4] Reprint from Psyche, 1889, pp. 171–180.

[5] PENHALLOW, D. P.—Review of Canadian Botany from the first settlement of New France to the nineteenth century. Part I. From the Trans. Roy. Soc. Can., v. 4, 45–61. 4to. Montreal: Dawson Bros. 1888.

voyage of Jacques Cartier to New France to 1800, was a period of very slow scientific progress, and the names of those who in any way contributed to botanical work in Canada do not exceed 24. Regarding these the author gives much interesting information, with notices of their work. It is evident that it has taken much time and labor to search out these facts, and the thanks of the antiquarian, as well as the historian and botanist, are due to Professor Penhallow.

AN IMPORTANT contribution to the knowledge of the moss-flora of New Guinea forms the last issued part of the Bibliotheca botanica.[6] The collections on which it was based were made by Bäuerlen in 1885 in the south, by Chalmers and Bridge in the Cloudy Mts. in 1884, and by Lawes in the Astrolabe Range. Eighteen new species are characterized and eight figured on the beautiful plates. An appendix enumerates the Hepaticæ of the same collections, including one new species.

CYPRESS "knees" have long been of special interest to morphologists. Dr. W. P. Wilson found favorable opportunity to study these structures while in Florida. A preliminary notice[7] describes two modes of formation, (*a*) by growing upward of young roots till they reach the air and then turning downward again, the knee forming at the angle; (*b*) by local outgrowths from the upper surface of old horizontal roots. Similar ærating organs were caused to form on Indian corn by keeping the soil saturated. They were also observed on Pinus serotina, Nyssa aquatica and Avicennia nitida.

OPEN LETTERS.

Flowers and Insects.

I have been much interested in Mr. Robertson's article on Flowers and Insects. Under Dicentra Cucullaria he refers to observations of others and myself in regard to the puncturing of the corolla by bees. I am pretty sure that the holes were made by honey-bees, as a large hive is in the next yard to mine, and my flowers constantly visited by its occupants. I have observed the same puncturing this year in my yard and that of Mr. George Hunt. It should be stated, however, that Dicentra is not indigenous here, and is only seen in cultivation. In the wild state it may, for all I know, be untouched.

W. W. BAILEY.

Providence, R. I.

The National Herbarium.

In the GAZETTE for April an allusion was made to the National Herbarium, which, perhaps, was not sufficiently definite. An arrangement

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[6] GEHEEB, ADELBERT.—Neue Beiträge zur Moosflora Neu-Guinea. Bibl. bot., heft 13. Pp. 12. pl. 8. 4to. Cassel: Theodor Fischer. 1889. M. 10.

[7] WILSON, WM. P.—The production of ærating organs on the roots of swamp and other plants. Proc. Acad. Nat. Sci. Phila. Apr. 2, 1889. 8vo. pp. 3.